

SECTION 22 31 16 WATER SOFTENER

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide a completely automatic water softener system as scheduled on the drawings, with all necessary equipment, controls, accessories, materials, etc.
- B. Equipment shall be as specified herein and located as shown on the drawings.

1.02 QUALITY CONTROL

- A. Where specified, water softening equipment serving the boiler make-up system shall be capable of removing hardness (expressed as CaCO₃) from the raw water to the extent that the effluent from the water softener will be zero (0) grains per gallon of hardness determined by an accepted soap hardness test method.
- B. Where specified, water softening equipment serving the domestic water system shall contain a piped by-pass for blending water to a level of 3 to 4 grains hard water to building system. See detail on drawings.

1.03 RELATED WORK

- A. Section 22 05 00: Common Work Results for Plumbing
- B. Section 22 05 23: Valves for Plumbing Piping
- C. Section 22 11 16: Domestic Water Piping
- D. Division 26: Electrical

1.04 SUBMITTALS

- A. Submit product data for review under provisions of Division 01.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Acceptable Manufacturers: Culligan Water Conditioning, Bob Johnson & Associates, Mueller and U.S. Filter.
- B. An authorized factory service agency providing twenty-four (24) hour service must be available within the Houston Metropolitan service area of this installation.

2.02 EQUIPMENT REQUIREMENTS

- A. Water Softening System: Vertical pressure type ion exchanger system with regenerating equipment, complete with all components required to insure proper operation.
- B. Softener Tank: Welded construction of quality carbon steel with dished heads, equipped with reinforced openings for piping connections:
 - 1. Provide two 3" diameter handholes for tanks 30" diameter and smaller, or 11" x 15" manhole in top head and 2" resin removal plug in lower sideshell for tanks over 30" diameter.

2. ASME Code rated at 125 psi working pressure.
 3. Tanks shall be lined with phenolic epoxy lining.
 4. Provide with earthquake resistant structural legs with bolt downs in accordance with site seismic rating.
- C. Internal Distribution: Design underdrain system to uniformly collect softened water as well as distribute backwash laterally across entire bed.
1. Header-lateral construction with minimum of two plastic strainers per S.F. of bed area.
 2. Furnish gravel sub-fill only, not extending above strainers.
- D. Upper Distribution System: Header-lateral manifold type arranged for uniform distribution of both brine solution and raw waste, as well as collection of backwash.
1. Construct both upper and lower distributors of Schedule 80 PVC or other approved non-corrosive material.
- E. Ion Exchange Resin: High capacity sulfonated polystyrene type requiring no chemicals other than sodium chloride to obtain specified capacity.
- F. Controls: Automatic regeneration thru electronic programmable water treatment equipment controller and flow sensor per softener tank to initiate regeneration. The controller shall be programmed to operate as parallel progressive
- G. Provide pressure gauges with sample cocks on inlet and outlet of each tank.
- H. Regenerating Tank: Rigid, molded polyethylene, or welded steel with flat bottom with bitumastic coating inside and rust inhibiting primer on exterior.
1. System shall be dry salt storage type with dry salt support shelf and shall allow for adjusting brine dosage to 6, 10, and 15 lbs. per cubic foot of resin.
 2. Provide automatic valve to control amount of brine draw.
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 4. Rated for seismic zone in accordance with site seismic rating.
 5. Provide necessary valves, educator and piping.

2.03 TEST KITS

- A. Provide water testing kit to make chemical tests necessary for controlling operation and adjustments of brine dosage.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install complete system with all piping valves and wiring.

3.02 START-UP AND TRAINING

- A. Contractor shall provide for the services of a competent supervising engineer from the water softener manufacturer to inspect the complete installation, start the water softening system in operation, and instruct the Owner's operators in the proper operation and care of the equipment. Such instruction shall be a minimum of two working days. Owner personnel shall sign-off on quality and duration of instruction.

3.03 WARRANTY

- A. The manufacturer shall guarantee that under actual conditions the effluent shall be zero (0) soft as determined by soap test, that the loss of mineral through attrition during the first three years of

operation shall not exceed 3% per year; that the mineral shall not be washed out of the system during the service run or backwashing the period; and that the turbidity and color of the effluent, by reasons of passing through the softener system, shall not be greater than the incoming water.

END OF SECTION